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## PATENT COOPERATION TREATY

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 1138.P040PCTj	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. <b>PCT/SG2004/000255</b>	International filing date ( <i>day/month/year</i> ) 23 August 2004	Priority date ( <i>day/month/year</i> ) 23 October 2003	
International Patent Classification (IPC) or national classification and IPC  Int. Cl. <sup>7</sup> G06F 13/30, H04M 1/66			
Applicant NANYANG POLYTECHNIC et al			

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 3 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
  - ☒ (sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:
    - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
- This report contains indications relating to the following items:
 

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application

Date of submission of the demand 23 August 2005	Date of completion of the report 29 September 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  <b>Mani Ramachandran</b> Telephone No. (02) 6283 2233

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SG2004/000255

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1 (b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

☐ the international application as originally filed/furnished

☒ the description:

pages **1-15** as originally filed/furnished

pages\* received by this Authority on with the letter of

pages\* received by this Authority on with the letter of

☒ the claims:

pages as originally filed/furnished

pages\* as amended (together with any statement) under Article 19

pages\* **16-19** received by this Authority on **23 August 2005** with the letter of **26 August 2005**

pages\* received by this Authority on with the letter of

☒ the drawings:

pages **1-4** as originally filed/furnished

pages\* received by this Authority on with the letter of

pages\* received by this Authority on with the letter of

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages

☐ the claims, Nos.

☐ the drawings, sheets/figs

☐ the sequence listing (*specify*):

☐ any table(s) related to the sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages

☐ the claims, Nos.

☐ the drawings, sheets/figs

☐ the sequence listing (*specify*):

☐ any table(s) related to the sequence listing (*specify*):

\* If item 4 applies, some or all of those sheets may be marked "superseded."

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/SG2004/000255

**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims 1-12	YES
	Claims	NO
Inventive step (IS)	Claims 1-12	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-12	YES
	Claims	NO

## 2. Citations and explanations (Rule 70.7)

### NOVELTY & INVENTIVE STEP Claims 1-12:

The invention defined in the claims is novel and inventive. None of the citations disclose the claimed invention in its entirety, nor is the invention arrived at by reading the claims in the light of common general knowledge, or by an obvious combination of the disclosures of the various citations.

The invention is industrially applicable.

### Claims

1. A method to detect and geographically locate a rogue user wirelessly accessing a computer network, the method comprising:
  - a. deploying at least one Network Management System program;
  - b. pre-identifying at least one island in the wireless computer network;
  - c. mapping a geographical area covered by the wireless computer network into the at least one island;
  - d. measuring at least one network performance parameter for each island to obtain a spatial performance model;
  - e. deriving a performance index for each island based on the at least one performance parameter;
  - f. identifying a potential rogue user based at least on his Media Access Control (MAC) address and Internet Protocol (IP) address;
  - g. measuring at least one performance parameter of the potential rogue user;
  - h. deriving at least one performance index for the potential rogue user;
  - i. determining location of the potential rogue user by comparing the performance index of the potential rogue user with historical, average performance indices of each island pertinent to the current time of detection; and
  - j. effecting at least one network security measure against the rogue user.
2. A method further to Claim 1, the deriving at least one network performance index for each island further comprising:
  - a. obtaining the differences between the captured values of the performance parameter of rogue user and the performance parameter in the spatial performance model;
  - b. determining the minimum value for each difference;
  - c. normalizing the values for each difference to obtain rank number; and

- d. summing the rank numbers for each island to obtain its performance index.
3. A method further to Claim 1, the deriving at least one network performance index for each island further comprising:
- a. determining the minimum values of each performance parameter in the spatial performance model;
  - b. normalizing the values of each performance parameter in the spatial performance model and captured performance parameters of rogue user to obtain the rank numbers;
  - c. obtaining the differences between the rank numbers of performance parameters in spatial performance model and the captured performance parameters of rogue user; and
  - d. summing the differences for each island to obtain its performance index.
4. A method further to Claim 1 wherein the deriving of at least one performance index further comprising dynamically re-mapping the islands previously mapped based on the current performance index of each island at time intervals.
5. A method further to Claim 1 wherein the deriving of the performance index of the potential rogue user is substantially similar to the deriving of the performance index for each island.
6. A method further to Claim 1, the determining of the geographical location of the potential rogue user by comparing further comprising matching the performance indices of the at least one island with the performance index of the potential rogue user.

7. A method further to Claim 1, the effecting at least one network security measure further comprising:  
logging particulars of the rogue user;  
displaying geographically location of the rogue user,  
denying access to the rogue user, and  
prosecuting the rogue user.
8. A system to detect and geographically locate a rogue user wirelessly.  
accessing a computer network, the system comprising:  
a computer network with at least one wireless access point;  
at least one processor;  
at least a network management system;  
at least one storage means; and  
  
at least one implementation of an algorithm to geographically locate the rogue user by matching at least one network performance characteristic of the rogue user with at least one network performance characteristic of at least one pre-mapped island of the network around the at least one wireless access point.
9. A system according to Claim 8, the computer network further comprising wireless access points which are connected to the wired computer network.
10. A system further to Claim 8, the at least one network management system further comprising at least one storage means further comprising storage of network performance parameter values, derived network performance characteristics and mapped islands covered by the at least one wireless access point.
11. A system further to Claim 8, the at least one storage means further comprising storage of network performance parameter values, derived

network performance characteristics and mapped islands covered by the at least one wireless access point.

12. A system further to Claim 8, wherein the at least one storage means may be part of the at least one network management system.